

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Modifications of Part 2 and 15 of the)	ET Docket No. 03-201
Commission's Rules for Unlicensed Devices)	
and Equipment Approval)	
)	

COMMENTS OF THE LICENSE-EXEMPT ALLIANCE

The License-Exempt Alliance (“LEA”) hereby submits its reply comments in response to the Commission’s *Notice of Proposed Rulemaking* (“*NPRM*”) in the above-captioned proceeding.¹

I. INTRODUCTION.

As the Commission is aware, the LEA is a nationwide coalition of Wireless Internet Service Providers (“WISPs”) and equipment vendors who provide or support the provision of broadband service via license-exempt spectrum in the 902-928 MHz, 2.4 GHz and 5 GHz bands. It has been and continues to be the primary advocate for “last mile” license-exempt broadband providers in Commission proceedings that directly affect the allocation and use of license-exempt spectrum.² The LEA thus has a direct and immediate interest in the *NPRM* and the proposals set forth therein.

¹ FCC 03-223 (rel. Nov. 18, 2003).

² See, e.g., Reply Comments of the License-Exempt Alliance, ET Docket No. 03-122 (filed Sept. 23, 2003); Comments of the License-Exempt Alliance, ET Docket No. 03-122 (filed Sept. 3, 2003); Reply Comments of the License-Exempt Alliance, ET Docket No. 02-380 (filed May 16, 2003); Comments of the License-Exempt Alliance, WT Docket No. 02-381 (filed Feb. 3, 2003); Comments of the License-Exempt Alliance, ET Docket No. 02-135 (filed Jan. 27, 2003).

As a general matter, the LEA applauds the Commission's proposals to amend Parts 2 and 15 of its Rules to facilitate wide-area wireless broadband service over license-exempt spectrum. Subject to the comments set forth below, the LEA believes that proper implementation of the rule modifications set forth in the *NPRM* will advance the Commission's objective of accelerating broadband deployment to areas that have little or no such service available to them. By the same token, however, the LEA wishes to emphasize that its membership has always been and continues to be sensitive to the concerns of the licensed community about the issues raised in the *NPRM*, and would not support any Commission action in this proceeding or elsewhere that would expose licensed users to an increased risk of harmful interference. Insofar as licensees are concerned, the primary issue here is whether the Commission's Part 2 and Part 15 rules, as modified, will protect licensed services from out-of-band emissions in the license-exempt bands.⁷ Furthermore, the Commission's proposals (particularly as to equipment certification) will be self-defeating if they merely promote interference in the license-exempt bands with no countervailing benefit to the public. Any Commission action in this proceeding ultimately must be guided by these overriding considerations, so that license-exempt operators can co-exist peacefully with their licensed and unlicensed competitors.

⁷ See, e.g., *Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitters*, 12 FCC Rcd 7488, 7516 (1997) ("With regard to the antenna employed with the system, changes to the antenna certified with the system often will change the amplitude levels of both the fundamental and the unwanted emissions. The Commission is particularly concerned about possible increases to emissions appearing in frequency bands allocated to sensitive radio services or services used for safety-of-life applications.").

II. DISCUSSION.

A. The LEA Generally Supports the Commission's Proposal to Permit Certain Advanced Antenna Technologies To Utilize The Higher Gain Permitted for Point-to-Point Operations in the License-Exempt 2.4 GHz Band.

Largely for the reasons already discussed in the comments submitted in this proceeding by wireless broadband equipment vendor Alvarion, the LEA supports the Commission's proposals to permit advanced antenna designs such as sectorized antennas and phased antennas to take advantage of the higher antenna gain permitted for point-to-point operations in the license-exempt 2400-2483.5 MHz band.³ The Commission correctly observes that its rulings on this issue thus far have been limited to informal staff rulings that are not easily accessible to the public, and that formal clarification in the rules is necessary to ensure that all vendors and users of new antenna technologies in the license-exempt bands are clear as to when they may use the higher antenna gain permitted for point-to-point operations.

In addition, unless the record developed in response to the *NPRM* suggests that an alternative approach is superior, the LEA supports the Commission's proposal to (1) limit the permissible bandwidth of higher gain, advanced antenna designs to at least two beams radiating in 120 degrees total on the same frequency, (2) limit the total output power on each individual beam to the applicable power level specified in Section 15.247(b) of the Commission's Rules, *i.e.*, 0.125 watt or 1 watt, depending upon the type of modulation used, (3) limit the aggregate power transmitted simultaneously on all beams to 8 dB above the limit for an individual beam, and (4) require that the transmitter output power of such antennas be reduced by 1 dB for each 3

³ See Reply Comments of Alvarion, Inc., ET Docket No. 03-201, at 1-5 (filed Dec. 19, 2003); *NPRM* at ¶¶ 6-8.

dB that the directional antenna gain of the complete system exceeds 6 dBi (which essentially is what the rules require now for conventional point-to-point operations on license-exempt 2.4 GHz spectrum). Taken together, these proposals are true to the broader intent of the power/antenna gain provisions in Section 15.207, and will make better use of the spectrum by promoting antenna configurations that transmit signals more precisely towards subscriber terminals and thereby cause less interference to other systems transmitting outside the advanced antenna's beamwidth (and, conversely, the advanced antenna would be subject to fewer unwanted emissions outside the transmitted beamwidths of other transmitters).

B. The LEA Supports More Flexible Antenna Requirements for License-Exempt Devices, But The Commission Should Not Permit Separate Marketing of Amplifiers Not Certified As Part of a "System."

The LEA agrees that license-exempt broadband providers would benefit from more flexible Commission rules that permit them more freedom to "mix and match" antennas with certified systems as necessary to accommodate subscriber demand.⁴ Provided that Part 15's unique connector and professional installation requirements are retained, such additional flexibility will improve customer service without compromising the RF environment to any meaningful extent. The LEA thus agrees that the Commission's equipment certification process should require testing of a system only with the highest gain antenna of each type that would be used with the system's transmitter when operating at maximum permitted output power. Among other things, this approach is far more efficient and less costly (both for testing labs and those applying for system certification) than the alternative of requiring recertification of every system with every type and gain variant of antenna that might be used with it. And, it is fair to expect

⁴ See NPRM at ¶¶ 12-13.

that equipment vendors will, as a matter of commercial necessity, keep their customers informed as to which antennas may be used with their systems without having to undergo recertification.

At the present time, however, the LEA does not support the Commission's proposal to permit similar "mixing and matching" of amplifiers with certified systems, even where the amplifier standing alone has been certified as compliant with the Commission's Part 15 power limits.⁵ Simply put, and particularly given the dramatic growth of license-exempt services generally, it would not be prudent for the Commission to permit mixing and matching of amplifiers. At the heart of the problem here is the fact that it is very difficult for a license-exempt operator (even one with experience in RF-related issues) can measure with any confidence that two different amplifiers are "technically equivalent" when used with the same transmitter. For instance, DSSS and OFDM systems require that power amplifiers have linear amplification. Once those amplifiers are put into compression, the result is significant increase in sideband noise and harmonic content. This, in turn, raises a number of questions about system performance that many operators will be unable to answer in the field – no assumptions can be made about how a given brand of amplifier will perform with any particular system. In the meantime, of course, both licensed and license-exempt users are exposed to a greater risk of harmful interference, which presumably is exactly what the Commission is trying to avoid in this proceeding.

The Commission also must remain cognizant of the risks associated with separate marketing of amplifiers at a time when it is contemplating a wholesale change in how it measures interference between licensed and unlicensed users. As the Commission is well aware,

⁵ See *NPRM* at ¶ 16.

the interference temperature and cognitive radio concepts endorsed by the Commission's Spectrum Policy Task Force remain in their earliest stages of development, and thus much work must be done before the Commission can even begin to determine whether those concepts are feasible. Against that backdrop, any rule modification that promotes ill-considered deployment of separately marketed amplifiers is premature at best, and at worst will render the Commission's task in its interference temperature and cognitive radio proceedings much more difficult than it already is.⁶

C. The Commission Should Eliminate the Ongoing Confusion About Professional Installation By Including a Clear Definition of "Professional Installer" in its Rules.

Under Section 15.203 of the Commission's Rules, users of equipment operating on license-exempt spectrum must utilize either a permanently attached antenna or a unique antenna connector with a transmitter authorized under Part 15. Compliance with this requirement is not necessary if the equipment at issue must be professionally installed. As the Commission points out in the *NPRM*, however, Part 15 provides little clarity as to who qualifies as a "professional installer," and the LEA further notes that Part 15 also is somewhat unclear as to the circumstances under which equipment "requires" professional installation. Hence, the Commission, after appropriate consultation with vendors and other entities that routinely conduct RF education programs for users of license-exempt equipment, should clarify the minimum

⁶ See *Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands (Notice of Inquiry and Notice of Proposed Rulemaking)*, ET Docket No. 03-237, FCC 03-289 (rel. Nov. 28, 2003); *Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies (Notice of Proposed Rulemaking and Order)*, ET Docket No. 03-108, FCC 03-322 (rel. Dec. 30, 2003).

qualifications for a professional installer under Part 15 (along with the required qualifications of certifying bodies), and explicitly include those qualifications in its Part 15 rules. The LEA will have more specific comments on this issue once it has an opportunity to review the proposals submitted by other parties and evaluate whether an appropriate compromise position among the parties is possible.

Equally important, the Commission should incorporate the substance of its informal rulings on professional installation into Section 15.203 of its Rules so as to eliminate any marketplace confusion as to when equipment must be professionally installed. According to informal rulings available on the Office of Engineering and Technology's web page, those criteria include the following:

- The device cannot be sold at retail, to the general public or by mail order. It must be sold to dealers who professionally install it.
- The device must *require* professional installation – it cannot be optional (in other words, the equipment must be installed by licensed professionals, and the installation process must require special training, *i.e.*, special programming, access to keypad, field strength measurements).
- The equipment generally is not intended for use by the general public – rather, it is generally intended for industry/commercial use.⁶

⁶ See, e.g., http://hraunfoss.fcc.gov/eas_public/SilverStream/Pages/pg_html_fts_res.html?letter=1002.

III. CONCLUSION.

In sum, and subject to the recommendations set forth above, the *NPRM* is another positive step in the Commission's ongoing effort to rationalize and improve its rules for license-exempt services. The LEA looks forward to working directly with the Commission and other interested parties to achieve the agency's goals in this proceeding.

Respectfully submitted,

LICENSE-EXEMPT ALLIANCE

By: _____ /s/
Doug Keeney
Chairman

745 W. Main Street
Suite 100
Louisville, KY 40202
(502) 213-3700
dougk@uswo.net

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